

DISPENSING APPLIANCE FOR WIPING MATERIAL

The invention relates to the technical field of automatically cutting dispensing appliances for wiping material of the wadded paper type for uses as hand
5 wipes and toilet paper and for wiping and cleaning in general.

The applicant has developed numerous appliances of this
10 type which conventionally comprise a housing, a cover, and a drum with an integrated cutting blade, said blade being capable of emerging from the drum during operation by virtue of means for the starting and return of the drum, including an eccentric and a return
15 starting spring which are arranged so as to commence from a lateral side of the drum. Lateral flanges of the housing are designed to support the reel of material which comes to bear on the drum either directly, according to the teaching of the patent FR 2,332,215,
20 or in a plane above the drum, without contact with the latter, as, for example, in the embodiment described in the patent FR 99 13691. In this specific embodiment, a press roller is capable of ensuring pressure on the strip of material at a given location, in addition to a
25 second pressure zone defined toward the cutting zone of the strip of material in the region of the drum.

According to the prior art developed by the applicant through his many patents, the loading reel can be
30 mounted either so as to bear on the drum receiving the cutting mechanism or so as to be in a plane above the drum and without contact with the latter. In this case, it is necessary to use a press roller which comes to bear on the drum and which makes it possible to tension
35 the strip of material to be cut. In all these cases, the reel of material must be offered in a particular direction, in such a way that the strip of material comes from the front of the appliance in order

subsequently to be introduced between the drum and the reel or the drum and the press roller. There is no possible alternative to the position of the reel, since the appliance would not operate. This type of appliance
5 is in very widespread use throughout the world, so that its optimized implementation conforms perfectly to the requirements of the market and to the conditions under which the user pulls the end of the strip of material.

10 There are, nevertheless, some limits to the use of this type of appliance, such as are afforded, for example, by the method of loading of the reel or by the very large overall size of the appliance. The latter disadvantage is extremely detrimental to some uses,
15 especially in domestic use. The reduction in volume of the appliance does not necessarily entail the reduction in the dimensions of its components, since the functionalities require a high-performance cutting device with a clean cut of the strip of material, for
20 each given cutting format.

Nor has the prior art beyond the applicant made it possible, either, to satisfy the requirements of miniaturized automatically cutting dispensing
25 appliances.

The applicant's approach was, therefore, to seek a novel type of radically different appliance which eliminates some essential components of the prior art,
30 in order to propose a dispensing appliance of small volume, with a reduction of the order of approximately 30 to 40% in relation to the equipment existing on the market at the present time.

35 The applicant's approach was therefore to provide a novel dispensing appliance redesigned entirely in terms of its structure and components, which is capable of

and functional for the automatic cutting of strips of material under the conditions desired by the users.

5 Another object sought by the applicant was then to standardize some common components of the appliance in order to allow cutting according to different formats of strips of material.

10 These objects and yet others will emerge clearly from the rest of the description.

According to a first characteristic, the automatically cutting dispensing appliance for wiping material, of the type comprising a basic housing with a back face and a lower face and receiving an articulated lid, is
15 notable in that the housing receives, demountably by latching, a cartridge defining a carrier structure comprising two transverse flanges, a connecting plate arranged between said flanges, and a front spacer bar,
20 the flanges receiving, in their upper part, connectors for supporting the reel of material and, in their lower part, two drums arranged side by side, without direct contact between them, the first drum being the blade carrier drum, the second drum being the guide drum, and
25 in that said drums are designed, at one of their ends facing one another, for receiving toothed rings allowing their connection and their rotation with respect to one another, and in that the drum is designed for receiving a third toothed ring cooperating
30 with the mechanism for starting the rotation of the drums, said mechanism including a fixed cam, and in that the blade carrier arm is designed with transmission means making it possible to implement the functioning of a movable cam allowing the emergence of
35 the cutting blade from said drum, and in that the fixed and movable cams cooperate with one another, at the same time defining the path of the cutting blade, and in that flaps ensure the guidance of the strip of

material in the appliance for the purpose of cutting said strip of material according to a specific format.

5 The invention is described in more detail below with the aid of the figures of the accompanying drawings in which:

- figure 1 is a partial view, before mounting, of the dispensing appliance according to the invention, set up in the form of cartridges inserted into a receiving housing,

15 - figure 2 is a partial view, in cross section along the line A.A of figure 3, illustrating the travel of the strip of material in the appliance for the purpose of the cutting of said strip of material,

20 - figure 3 is a top view of the appliance according to figure 2,

- figure 4 is a partial view illustrating the use of a template for ensuring a format setting,

25 - figure 5 is a partial view in section,

- figure 6 is a partial view in section, illustrating the positioning of cam means used within the scope of the invention,

30 - figures 7, 8, 9 and 10 are views of a diagrammatic nature, illustrating the various positions with respect to one another of two cams participating in the emergence of the cutting blade,

35 - figures 11 and 12 are partial views, in section, of a format selector device in one embodiment of the invention,

- figure 13 is a partial view, in section, rear view.

In order to make the subject of the invention clearer
5 in physical terms, it is now described in a nonlimiting way illustrated in the figures of the drawings.

The automatically cutting dispensing appliance
according to the invention for wiping material is
10 designated by (1). It makes it possible to dispense any type of material, including, in particular, paper and wadding, in uses as hand wipe paper, toilet paper and all-purpose wiping paper and in other similar uses.

15 This appliance has a small format, as compared with the prior art, and, in particular, it is designed in dimensions which, for example, may be of the order of 28 x 25 x 20 centimeters, while at the same time making it possible to process reels of several kilos. The
20 appliance comprises a basic housing (2) with a back face (2.1) and a lower face (2.2) in prolongation, the latter forming a bearing plane. This housing is capable of receiving an articulated lid (3) at its face, while a key-type closing device known per se ensures the
25 closure of the assembly as a whole.

According to the invention, the housing receives, demountably and by latching, a cartridge (c) forming a carrier structure defined by two transverse flanges
30 (4 - 5) receiving various components and allowing the positioning of these in relation to one another and, in particular, of various rollers, the function of which will be specified later. The two flanges (4 - 5) are braced in their rear part by means of a connecting
35 plate (6) of great length. The flange/connecting-plate assembly can be molded in one piece. In the upper part, the flanges can receive spindles (7) for the support of connectors (8), between which the reel (b) of material

is arranged. At least one of the flanges can be moved elastically apart outwardly in order to make it easier to introduce the reel.

5 According to the invention, the lower part of the carrier structure receives two drums (9 - 10) which are arranged side by side, but without direct contact between them, and the ends (9.1 - 10.1) of which are mounted in holes (4.1 - 5.1) formed on the
10 abovementioned flanges. The two drums are nevertheless associated with one another, since they each receive, at one of their ends which are located in the same side, a first and a second toothed ring (11 - 12) which mesh with one another. The first drum (9) is called a
15 blade carrier drum, while the second (10) is called a guide drum.

The drum (9) arranged at the rear is internally hollow and receives a cutting blade (13) produced in one or
20 two parts and articulated on a blade carrier arm (14). This cutting blade is characterized by a twisted shape of the whole of its teeth, making it possible to have an effect of progressive penetration of the blade into the material from the ends toward the central zone of
25 the latter. Each tooth is advantageously located in a plane perpendicular to the longitudinal axis of the drum. More particularly, as illustrated in the drawings, the cutting blade is designed in two parts (13.1, 13.2) fastened to the blade carrier arm (14) by
30 means of screws or otherwise. The two blade parts meet toward the central part of the drum (9.1), while at the same time leaving a space (e) corresponding, in practice, to a cradle (15) for supporting the blade carrier arm with respect to the inner bottom of the
35 drum. This cradle has an indentation allowing the arm to rotate on itself. At the termination of the arm, one end (14.1) of the latter has a projecting abutment (16) which comes into contact with stroke-limiting bearing

planes (17) formed on the transverse face (9.2) of the drum. The other end (14.3) of the arm receives a notched collar (18) adjacent to the first toothed ring (11), as recalled above. The notched collar is mounted
5 rotatably together with the arm. The function of this notched collar will be specified later.

The second guide drum (10) has, in its central part, a radial cavity (10.1) which is in the prolongation of
10 the cradle (15) for supporting the blade carrier arm (14) of the first drum (9). This second drum (10) receives at the end a second fixed toothed ring (12) cooperating with the first fixed ring (11) in the first drum. Said second drum has a spindle (10.1) capable of
15 coming into engagement in a bearing-forming recess made in the lower part of the opposite flange. Said spindle is capable, moreover, of receiving, between the second toothed ring (12) and the flange, a third toothed ring (19) of small diameter which is capable of cooperating
20 with a complementary fourth toothed ring (20) mounted on the opposite flange (4). This fourth toothed ring (20) is of larger diameter in a much higher dimensional ratio, and comprising a number of teeth corresponding to the dimension of the format of the strip of material
25 to be cut. Said fourth toothed ring (20) is capable of cooperating with a no-return pawl (22) mounted on a pin (23) fastened to the flange (4) together with an abutment (22.1). The fourth toothed ring (20) receives, on its face (20.1) opposite the flange, a profiled
30 fixed cam (24), the function of which will be described later. The fourth ring (20) has, on its face (20.2) toward the drums (9 - 10), an orifice (20.3) allowing the positioning of a finger (42.1) of a link (42) in the other end (42.2) which makes it possible to fasten
35 a return spring (26), the other end of which is integral with a fixed point (27) formed on the flange (4). The link thus ensures an eccentric function during the rotation of the ring (20) counter to the return

spring (26), at the same time forming the mechanism for starting the rotation of the drums (9 - 10).

According to another arrangement, the shaft (9.1) of the drum (9) is prolonged on the flange side so as to receive a movable cam (27) articulated on the shaft, this cam being profiled in a specific way in order to cooperate, in certain operating phases, with the abovementioned first cam (24).

According to another arrangement of the invention, the two drums (9 - 10) have, near their respective first and second toothed rings (10 - 11), two recesses (47), opposite or not, allowing the temporary insertion of a template-forming caliper (29), the end of which is designed in the form of a fork so as to penetrate into the recesses (47). The function of this caliper is to make it possible to set the various toothed rings in position in relation to one another as a function of the format of the strip of material to be dispensed. This template has a spindle (29.1) capable of engaging into the central axial orifice (20.4) of the ring (20). Said template also has an index (29.2) engaging into an orifice (20.5) formed on the ring (20). This orifice is arranged in a special way for format setting. It defines the position of the toothed ring (20) supporting the fixed cam (24), this being in relation to another movable cam (27) which will also be described.

According to another arrangement, the drum (10) is capable of receiving in its radial cavity (10.1), with free and controlled articulation, a fork-shaped attached tab (30) integral with a flap (31), this flap being capable, after the positioning of the tab by latching on the drum (10), of covering the drum (9) completely and the drum (10) partially. Said flap has on the inside uniformly arranged projecting ribs

(31.1), the function of which is to ensure the guidance of the strip of material during cutting.

According to another arrangement, a lower flap (32) is mounted so as to be articulated from a front spacer bar (43) formed between the flanges (4 - 5). This lower flap has a curved shape capable of substantially surrounding the drum (10) over an angular sector and from underneath the drum (10). This flap opens at the front of the appliance and allows the introduction and guidance of the free end of the strip of material coming from the reel.

According to another arrangement, the drum (9) has, at the termination of its shaft, on the opposite side to said toothed rings, a bearing surface (9.5) capable of receiving fixedly a large-diameter loading wheel (33) projecting externally from the cartridge and from the appliance, in order to allow manual control for the user to carry out the loading or fault correction of the reel of material to be dispensed.

Referring to the drawings, in particular figure 2, the travel of the strip of material has been illustrated.

The reel of material can be put in place between the supporting flanges in one direction or the other, that is to say the strip unwound from the reel is located either at the front of the appliance, as illustrated in figure 2, or toward the rear of the latter (not illustrated). Said strip is then introduced between the roller (10) and the retractable lower flap (31), at the same time passing in front of the appliance, and then the strip is introduced and guided so as to pass between the two drums (9 - 10) in order to be wound partially onto the drum (9) comprising the cutting device. A guide (38) integral with the front spacer bar (43) ensures the upward return of the strip of material

between the drums (9 - 10). The strip of material emerges at the rear of the appliance, at the same time being guided by the articulated flap (31).

5 According to another arrangement, the blade carrier arm (14) receives, at the termination of its end, a pinion (18) which is capable of cooperating with a complementary pinion (36) formed laterally on the movable cam (27). Thus, the displacement and emergence
10 of the cutting blade give rise, in parallel and simultaneously, to the positioning of the movable cam under the conditions which will be explained below with reference to drawings 7, 8, 9 and 10.

15 The movable cam (27) has a specific configuration, with a semicircular rear part (27.a) prolonged by a first rectilinear slope (27.b) and a second rectilinear slope (27.c), but oriented angularly with respect to the first slope, so as to approximate a beak shape (27.d)
20 continued by a connecting line (27.e) to the rear part of the cam.

The fixed cam (24) arranged eccentrically on the fourth inner ring is of smaller dimension and is bean-shaped,
25 in particular with a rectilinear base (24.1).

It is appropriate, at this juncture, to describe the functioning of the appliance.

30 The loading of the reel involves introducing the free end of the latter between the retractable lower flap (32) and the drum (10) which, for this purpose, advantageously has a gripping surface. The strip is guided between the two drums (9 - 10), and then, by
35 virtue of the bearing effect of the upper flap, said strip is wound partially around the drum (9) so as to emerge behind the latter. In the initial state, the cutting blade is integrated in its drum (9), without

emerging. The return spring is not subjected to extension stress. When the strip of material is pulled by the user, this gives rise progressively and simultaneously to the rotation of the drum (9) which meshes with the drum (10) by means of respective first and second rings (10 - 11). The third ring (19), adjacent to the first ring (11), causes the rotation of the fourth ring (20). The no-return pawl, penetrating into the teeth of the ring (20), locks the mechanism in position, while preventing a return into position. The fourth ring (20) rotates. The connecting and fastening point of the link (42) moves away, at the same time causing the extension of the return means (26) until the latter exceeds a dead center corresponding to the maximum distance of the fastening point of the link with respect to the fixed fastening point formed on the flange. The rotation of the toothed ring (10) simultaneously brings about the rotation of the notched collar (18) mounted on the blade carrier arm and therefore the progressive emergence of the cutting blade from the drum (9). In practice, the emergence of the cutting blade takes place at the termination of the second revolution of the drum (9) on itself, in particular with regard to a format of 25 centimeters. At maximum dead center, the cutting blade has fully emerged, and the exceeding of dead center causes the return of the mechanism and of the cutting blade into the initial position, along with a corresponding cutting of the strip of material.

The retraction of the cutting blade takes place as a result of the contact of the two teeth (13.3) brought closer together near the middle zone of the drum. These two teeth come into perpendicular contact with two abutments (41) which are made from rubber which, by virtue of a counterbearing effect, allow the blade carrier to tilt rearward on itself, along with the

pivoting of the blades and therefore of the teeth, until they return into the drum (9).

Referring now to the two fixed (24) and movable (27) cams mentioned above, figures 7, 8, 9 and 10 illustrate the various respective positions of these. In the initial situation, figure 7, the fixed cam is away from the movable cam, and is located substantially opposite the latter. The pull on the strip of material causes the tilting of the movable cam until the position in figure 8 is reached. In this situation, the cutting blade remains retracted in the drum. After the user continues with the manual pull, the two cams come into contact with one another, figure 9, and the movable cam temporarily becomes fixed. The outer curved part of the fixed cam comes into contact with the second rectilinear zone of the movable cam, said second rectilinear zone being adjacent to the beak. The continuation of the pulling movement gives rise progressively to the escape of the movable cam until their two beaks come opposite one another and correspond to the maximum emergence of the cutting blade (figure 10). The cams resume their initial position after dead center is passed in this way.

It is now appropriate to explain another particular arrangement of the invention which makes it possible to vary the format of the strip of material to be cut.

A first possibility involves arranging on the drum (10) a toothed ring (12) defined with a suitable number of teeth for the selected format, for example 25 centimeters. This corresponds to the embodiment illustrated in figure 1. The change of format makes it necessary to change the ring (12) for another ring having a different number of teeth, and a different dimension ratio will be obtained between the rings (20 and 12), thus making it possible to obtain a different

format, for example 37 centimeters. If the ring (12) is molded together with the drum (10), it is only this component which will have to be changed, the others remaining the same. It is expedient to note that, as a function of the diameter of the ring (20), two or three turns of the drum (9) will be necessary before the emergence of the cutting blade.

In an alternative embodiment corresponding to a second possibility, figures 11 and 12 illustrate an arrangement of the appliance which allows format selection directly, without the drum (10) having to be changed.

For this purpose, the drum (10) is arranged differently so as to receive a movable spindle (10.1) capable of receiving a sliding pinion (45). The movable spindle (10.1) slides axially with respect to the drum (10), while being held at its two ends, on the one hand, by the drum itself and, on the other hand, by an orifice formed in the abovementioned flange (4). Said drum is arranged, in its end part, with a profiled inner cavity making it possible, on the one hand, to accommodate and guide the end of the spindle (10.1) and, on the other hand, to accommodate the ring (19) in a specific position. Said ring (19) is integral with the movable spindle (10.1), but within a space (1.e) for moving away with respect to the sliding pinion (45).

Moreover, this second embodiment requires an arrangement of the toothed ring (20). The latter is then associated with a fifth toothed ring (21) having a number of teeth different from that of the ring (20). The no-return hook (22) cooperates with the fifth ring (21), and the fixed cam (24) is integral with the inner face of the ring (21).

Moreover, the movable spindle (10.1) has a radial finger or index (10.1b) which forms the push element of said spindle so as to present the pinions (45 and 19) in the suitable way, as illustrated in figures 11 and 12. According to figure 11, corresponding, for example, to a format of 25 centimeters, the ring (19) cooperates with the ring (20). The sliding pinion (45) is pushed back toward the flange (4). For the purpose of selecting a different format, for example 37 centimeters, the operator pushes the index so as to cause the displacement of the movable spindle (10.1). In this situation, the sliding pinion (45) comes into contact with the ring (21), while the pinion (19) is integrated into the inner recess of the drum (10), without any effect.

In this embodiment, the selector mechanism requires prior setting by the operator.

The advantages emerge clearly from the invention. The novel design of the dispensing appliance is stressed, offering, in a reduced volume, an automatic dispensing of strips of material, along with a simplification of the mechanisms used. The reel can be presented by the operator responsible for maintenance in any direction in the appliance. A standardized design of cartridges may be considered, with a set of mechanisms allowing a dispensing of formats according to a first length, for example 25 centimeters, and another cartridge making it possible, by suitable means, to dispense material according to another format, for example 37 centimeters. It is then sufficient to change the cartridge. The two cartridges are identical, with the exception of one of the toothed rings, to be precise the fourth which defines the number of teeth in relation to the paper format. Alternatively, a selector device may be integrated in the cartridge, but it is

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then necessary, each time, for the operator to carry out settings and therefore manipulations.